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ABSTRACT

This study examined the state funding basis as evidenced in both the old Strayer-Haig-Mort formula and the local composite index formula in order to determine if the new formula has made any significant progress toward fiscal equalization. The results were not at all convincing in support of either formula. The new formula was conceived as a better means of equalizing funds, but, with all its special considerations (for instance, a no-loss provision), it appears not to have been completely successful. The only indicator that seems to be in support of the local composite index is that the smaller school divisions seem to have increased on a more consistent basis than the larger divisions. However, because the new formula uses a variety of indicators for wealth per pupil (property tax, sales tax, corporate utility values, and local income) whereas the old formula used only taxable property and corporate utility values, the local composite index formula seems to be somewhat better from a theoretical standpoint. (Author/IRT)

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A STATISTICAL COMPARISON OF THE STRAYER-HAIG-MORT AND THE LOCAL COMPOSITE INDEX PUBLIC SCHOOL FINANCE FORMULA IN THE COMMONWEALTH OF VIRGINIA

by
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The 1974-1975 school year saw Virginia change from a Strayer-Haig-Mort formula to a "local composite index" formula for funding education in the state. Equalization was the goal of the new formula; i.e., an attempt was made at equalizing the dollars flowing for education to all the school localities on a basis of average daily membership(ADM), true value of real estate, individual income levels, and general sales tax for each locality. Previous to this, the old method was simply based on wealth per child i.e., a Strayer-Haig-Mort grant-in-aid formula.

While the new formula has supposedly "equalized" the funding process, very little, if any, investigation of the new formula in Virginia has occurred to date. With the exception of Salmon and Shotwell,[1] no studies have appeared examining the results of this change of distributing financial support.

1. Richard G. Salmon and Ralph F. Shotwell, "Virginia School Finance Reform: Status Quo Maintained," Journal of Education Finance, Spring 1978, pp. 524-535.

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As a follow up to the Salmon and Shotwell study a statistical comparison was conducted as follows:

(1) The school divisions were ranked in one list as to the wealth per child in 1973-1974 which was the measure of fiscal ability to pay under the Strayer-Haig-Mort formula. The wealth per child was computed in the following manner: the true (1973) values of locally taxed property, real estate, and public service corporations divided by the 1973-1974 average daily attendance(ADA).

(2) The school divisions were ranked in one list as to the "local composite index" in 1974-1975 which was the measure of fiscal ability to pay under the new formula. (See Appendix A). The local composite index is determined by a)true values of real estate and public service corporations as reported by the State Department of Taxation for the calendar year 1973 equaling fifty per cent(50%), b)individual income level for the calendar year 1973 as determined by the Tayloe Murphy Institute at the University of Virginia equaling forty per cent(40%), and c)the sales for the calendar year 1973 which are subject to the state general sales and use tax equaling ten per cent(10%). Each constituent index element for a locality is its sum per ADM, or per capita, expressed as a percentage of the state average per ADM, or per

capita, for the same element.

(3) Eliminate those divisions which either no longer exist in the local composite index formula or new divisions which did not exist in the Strayer-Haig-Mort formula; then rank them accordingly, (e.g., Manassas City, and Saltville were eliminated).

(4) A Spearman rho correlation coefficient was obtained between the Strayer-Haig-Mort and local composite index rankings of all school divisions. (See Appendix A).

(5) The scattergram shows the correlation between the rankings under the old and new formula. (See Appendix B).

(6) Those divisions showing stability plus or minus five rank changes were then examined in more detail. This involved a computation which reflected a percentage of basic state school funds received by each division for each school year examined. (The percentage change, if any, is shown in Appendix D).

(7) Those divisions so identified and examined in the previous step were then placed in the appropriated cells in Appendix E.

ANALYSIS AND CONCLUSIONS

A Spearman rho procedure was utilized to examine the data. The basic assumption underlying this procedure was that the higher the wealth per pupil based on the Strayer-Haig-Mort formula, the higher the local composite index. This assumption was pursued although the writers remained cognizant of the fact that the local composite index as used in the new formula was based to a significant degree on wealth per pupil as used in the old formula. The results of the Spearman rho procedure (Appendix A) between the rankings reflected a .861 correlation with a significant level of .001 which tended to lend support to this basic assumption. A scattergram was also plotted using 134 school divisions that had been in continous existence since the 1973-1974 school year. The scattergram reflected an almost perfect linear relationship between the wealth per pupil ranking and the local composite index ranking which added further support to this assumption. Based on these results, it would be expected that the lower the ranking of a school division based on the local composite index of the new formula, the larger the percentage of state funds received. Conversely, the higher the local composite index, the smaller the percentage of state funds received, assuming the new formula is utilized exactly as conceived. However, a more in-depth examination

of the data revealed a somewhat different picture. Percentages of state funds received were computed for each school division under both the formulas and the percentage of increase, or decrease, noted.

The new formula which is theoretically considered to be a better indicator of local wealth was compared on a percentage basis of state funds received under both formulas with our expectations as previously cited. However, the authors' expectations were not necessarily supported. The wealthiest school district under both formulas was Williamsburg. Williamsburg increased 6.27% in state funds received when comparing the old with the new formula. On the opposite end of the spectrum, Lee County, still remained last under both formulas, yet Lee County increased 7.93% in terms of the percentage of state funds received.

Clearly, in examining Appendix A concerning the rankings then by examining those stable divisions and comparing the poorer districts to the wealthier, the poor gained only a small amount. In terms of their ability, they gained virtually nothing. Therefore, equalization was not apparent in any form when one closely examines Appendices A and D. In terms of the percentage received or the percentage gained the new formula does not stand out as being superior to the old 100% wealth per pupil based formula.

When the school divisions exhibiting stability were placed in cells based upon division size and wealth,

mixed results occurred. It appears that poorer, small school divisions made a greater gain in percentage of state funds received. However, it was not a major gain. In the remaining cells nearly everyone gained slightly. The large school divisions of Alexandria and Arlington lost. Overall, there appears to be no clear relationship emerging from those stable divisions. No clear pattern appears to substantiate the idea that the new formula is more equal. On the other hand, most districts (from the poorest to the wealthiest) appear to receive a greater share of state funds[2]

In conclusion, it was the purpose of this study to examine the state funding basis as evidenced in both the Strayer-Haig-Mort and the local composite index formulas in order to determine if, in fact, the new formula as made any significant progress toward fiscal equalization. Based on an analysis of all assemble materal, the results were not at all convincing in support of one formula over the other. the new formula was conceived as a means of better equalizing funds toward equal educational opportunity but, with all the special considerations (i.e., no loss provisions, etc.), it appears not to have been completely successful. The only indicator which seems to be in support of the local composite index is that the smaller school divisions seem to have increased on a more consistent

2. this may or may not be a function of the new formula as it may be in fact due to inflation

basis than the larger divisions, although most all divisions increased to some degree. However, it was noted that the new formula uses a variety of indicators for wealth per pupil (i.e., property tax, sales tax, corporate utility values, local income, etc.) whereas the old formula used only taxable property and corporate utility values as a measure of local ability. In as much as the local composite index formula considers more variables for funding, it appears to be somewhat better from a theoretical standpoint.

While the authors' recognize the fact that no significant progress appears to have been made toward a more equitable distribution of state educational funds, we do recognize that is is a step in the proper direction toward fiscal equalization if, in fact, fiscal equalization can be achieved.

APPENDIX A

1973-1974 SCHOOL YEAR			1974-1975 SCHOOL YEAR	
WEALTH PER CHILD	RANK	COUNTY/CITY	RANK	COMPOSITE INDEX
583,560	1	WILLIAMSBURG	1	3.9720
328,616	2	SURRY	2	3.3956
122,973	5	FALLS CHURCH	3	2.5198
157,747	3	ARLINGTON	4	2.4344
121,334	6	ALEXANDRIA	5	2.0135
135,508	4	HIGHLAND	6	1.5586
108,257	8	FAUQUIER	7	1.5000
74,347	24	HARRISONBURG	8	1.4735
80,175	18	WINCHESTER	9	1.4723
69,573	30	FAIRFAX CITY	10	1.4713
76,599	23	CHARLOTTESVILLE	11	1.4575
73,396	25	FREDERICKSBURG	12	1.4468
103,835	9	LANCASTER	13	1.4274
109,333	9	NEW KENT	14	1.4046
100,008	10	RAPPAHANNOCK	15	1.3005
58,775	43	RICHMOND CITY	16	1.2850
97,111	11	NORTHUMBERLAND	17	1.2754
77,014	22	LOUDON	18	1.2471
56,354	47	GALAX	19	1.2445
83,826	15	BATH	20	1.2273
65,803	35	FAIRFAX	21	1.2218
55,032	51	LYNCHBURG	22	1.2218

1973-1974 SCHOOL YEAR			1974-1975 SCHOOL YEAR	
WEALTH PER CHILD	RANK	COUNTY/CITY	RANK	COMPOSITE INDEX
88,030	13	GOOCHLAND	23	1.1989
86,072	14	MIDDLESEX	24	1.1704
73,197	26	WARREN	25	1.1648
77,608	21	CLARKE	26	1.1648
70,315	29	PRINCE EDWARD	27	1.1449
48,944	69	ROANOKE CITY	28	1.1435
51,127	60	HENRICO	29	1.1271
79,826	19	ALBEMARLE	30	1.1251
62,970	38	WEST POINT	31	1.1234
53,307	53	STAUNTON	32	1.1210
80,271	17	MATHEWS	33	1.1183
56,771	49	LEXINGTON	34	1.1108
88,582	12	KING & QUEEN	35	1.1085
46,932	77	MARTINSVILLE	36	1.1006
82,289	16	FLUVANNA	37	1.0944
71,690	27	SPOTSYLVANIA	38	1.0790
67,066	31	COLONIAL BEACH	39	1.0747
78,194	20	LOUISA	40	1.0626
70,787	28	GLOUCESTER	41	1.0585
63,431	37	ORANGE	42	1.0495
44,866	82	NORFOLK	43	1.0248
66,076	34	SHENANDOAH	44	1.0237
66,234	33	CULPEPER	45	1.0221
48,268	72	WAYNESBORO	46	1.0161

1973-1974 SCHOOL YEAR			1974-1975 SCHOOL YEAR	
WEALTH PER CHILD	RANK	COUNTY/CITY	RANK	COMPOSITE INDEX
62,782	39	ESSEX	47	1.0126
52,115	56	CHESTERFIELD	48	1.0100
65,157	36	PAGE	49	.9843
49,266	65	NEWPORT NEWS	50	.9770
58,910	42	RICHMOND	51	.9684
53,747	52	HANOVER	52	.9640
51,602	59	PRINCE WILLIAM	53	.9521
40,788	89	DANVILLE	54	.9447
35,420	112	BRISTOL	55	.9295
47,649	75	COVINGTON	56	.9209
66,571	32	FLOYD	57	.9151
39,240	93	COLONIAL HEIGHTS	58	.9100
51,844	57	KING GEORGE	59	.9010
57,418	44	ISLE OF WIGHT	60	.8979
37,857	101	SOUTH BOSTON	61	.8961
48,168	73	VIRGINIA BEACH	62	.8888
49,215	66	KING WILLIAM	63	.8844
50,304	62	YORK	64	.8786
56,599	46	CAROLINE	65	.8653
39,821	91	RADFORD	66	.8637
59,458	41	MADISON	67	.8629
51,662	58	STAFFORD	68	.8566
50,338	61	FREDERICK	69	.8527
30,341	122	NORTON	70	.8499

1973-1974 SCHOOL YEAR			1974-1975 SCHOOL YEAR	
WEALTH PER CHILD	RANK	COUNTY/CITY	RANK	COMPOSITE INDEX
62,015	40	BUCKINGHAM	71	.8489
57,107	45	ROANOKE	72	.8404
50,150	63	ROCKINGHAM	73	.8403
40,878	86	HOPEWELL	74	.8324
48,131	74	ACCOMACK	75	.8317
39,794	92	PETERSBURG	76	.8268
48,984	68	BOTETOURT	77	.8165
52,837	54	POWHATAN	78	.8109
45,681	79	MONTGOMERY	79	.8103
52,756	55	AMELIA	80	.8095
29,517	125	CLIFTON FORGE	81	.8089
47,391	76	APPOMATTOX	82	.8026
28,878	129	PRINCE GEORGE	83	.7971
49,273	64	WESTMORELAND	84	.7837
49,006	67	ROCKBRIDGE	85	.7742
45,010	80	AUGUSTA	86	.7733
33,619	118	PORTSMOUTH	87	.7669
48,479	71	PATRICK	88	.7594
39,090	95	CAMPBELL	89	.7498
35,430	111	SUFFOLK	90	.7482
55,829	50	BEDFORD	91	.7478
32,923	120	HAMPTON	92	.7468
36,921	103	NOTOWAY	93	.7467
44,945	91	CRAIG	94	.7439

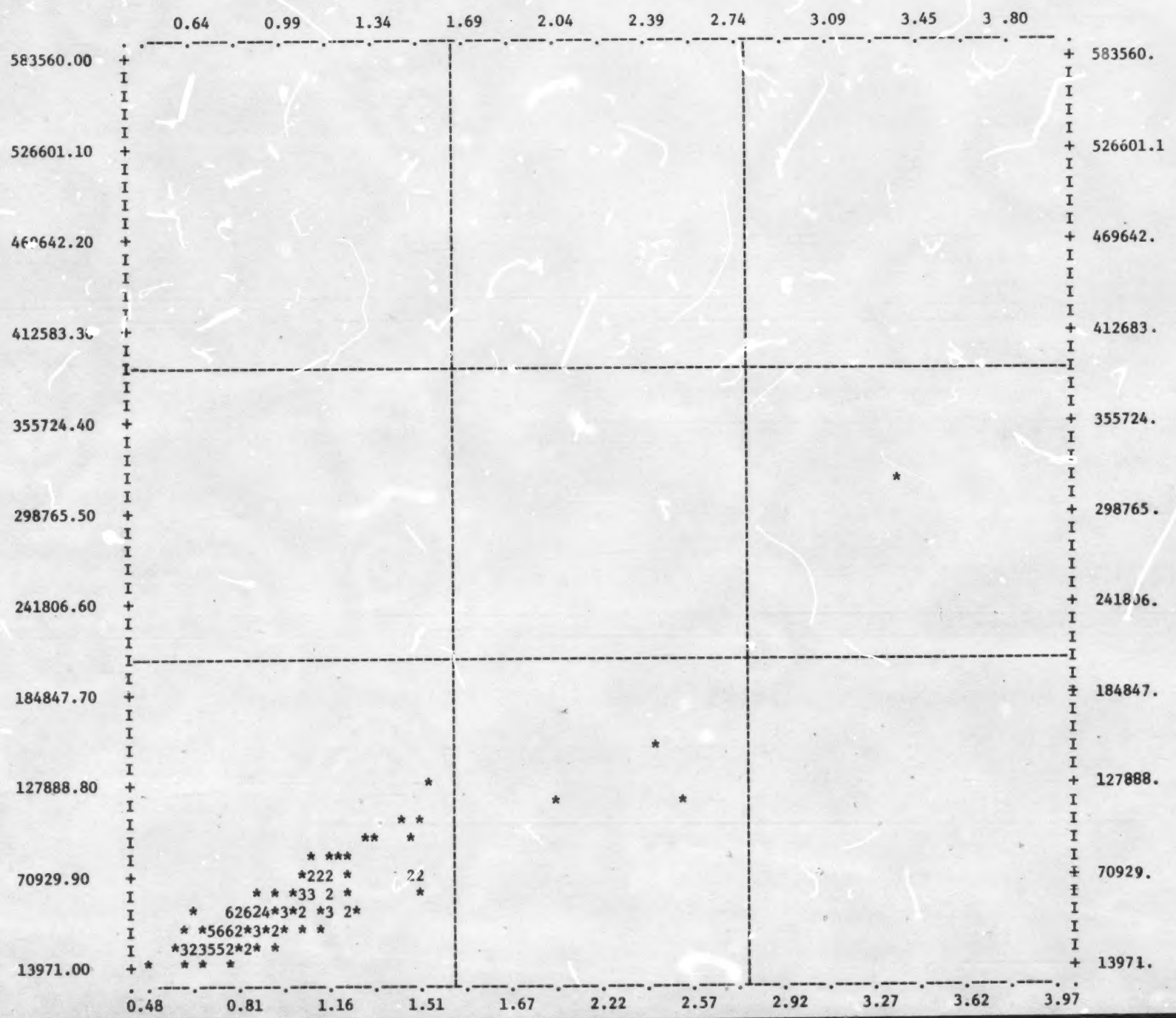
1973-1974 SCHOOL YEAR			1974-1975 SCHOOL YEAR	
WEALTH PER CHILD	RANK	COUNTY/CITY	RANK	COMPOSITE INDEX
42,228	85	GILES	95	.7390
48,816	70	NELSON	96	.7385
13,971	134	FRIES	97	.7321
42,764	84	BRUNSWICK	98	.7280
35,165	113	MECKLENBURC	99	.7238
46,415	78	CUMBERLAND	100	.7198
36,832	104	WYTH	101	.7107
39,101	94	SUSSEX	102	.7086
35,436	110	POQUOSON	103	.7034
35,517	109	NORTH HAMPTON	104	.7011
43,163	83	CARROLL	105	.6998
40,825	86	BLAND	106	.6977
34,178	115	BUENA VISTA	107	.6959
35,776	108	CHESAPEAKE	108	.6873
38,456	98	AMHERST	109	.6858
33,818	113	PULASKI	110	.6839
37,945	99	SOUTHAMPTON	111	.6825
36,262	105	LUNENBURG	112	.6815
40,108	90	BUCHANNAN	113	.6794
40,828	87	GRAYSON	114	.6768
35,108	107	DINWIDDIE	115	.6712
31,907	121	HENRY	116	.6703
37,940	100	HALIFAX	117	.6605
39,076	96	RUSSELL	118	.6480

1973-1974 SCHOOL YEAR			1974-1975 SCHOOL YEAR	
WEALTH PER CHILD	RANK	COUNTY/CITY	RANK	COMPOSITE INDEX
36,075	106	CHARLOTTE	119	.6392
27,916	130	TAZEWELL	120	.6373
56,176	48	GREENSVILLE	121	.6361
34,041	116	SMYTH	122	.6338
19,182	133	CAPE CHARLES	123	.6256
39,041	97	WASHINGTON	124	.6196
29,581	126	SCOTT	125	.6074
35,065	114	ALLEGHANY	126	.6061
30,089	123	PITTSYLVANIA	127	.5720
33,246	119	CHARLES CITY	128	.5582
29,992	124	DICKENSON	129	.5528
23,399	131	WISE	130	.5502
29,250	127	GREENE	131	.5377
20518	132	LEE	132	.4620

Spearman rho= .861

$p > .001$

APPENDIX B



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APPENDIX C

CHANGE IN RANK

HENRY	+5
LOUDOUN	+4
TAZEWELL CAPE CHARLES WYTHE PULASKI	+3
FALLS CHURCH PRINCE EDWARD	+2
ALEXANDRIA FAUGUIER WARREN SCOTT WISE	+1
WILLIAMSBURG SURRY HANOVER MONTGOMERY CHESAPEAKE LEE	NO CHANGE
ARLINGTON ACCOMACK	-1
HIGHLAND KING GEORGE YORK	-2
KING WILLIAM	-3
LANCASTER PITTSYLVANIA GREENE	-4
RAPPHANNOCK BATH CLARKE NEW KENT NORTHAMPTON DICKENSON	-5

APPENDIX D

COUNTY/CITY	PER CENT OF STATE FUNDS 1973-1974	PER CENT OF STATE FUNDS 1974-1975	Δ%
WILLIAMSBURG	.7371	.7833	6.27
SURRY	.7141	.7427	4.01
HANOVER	.7531	.8544	13.45
MONTGOMERY	.7197	.8270	14.91
CHESAPEAKE	.7716	.8752	13.43
LEE	.8073	.8713	7.93
ARLINGTON	.7749	.7101	(8.36)
ALEXANDRIA	.7978	.6924	(13.21)
FAUQUIER	.5753	.6264	8.88
ACCOMACK	.8098	.8766	8.25
SCOTT	.7109	.6553	(7.82)
WISE	.7883	.8580	8.84
FALLS CHURCH	.7702	.7204	(6.47)
HIGHLAND	.6858	.6897	.57
KING GEORGE	.6772	.8140	20.20
YORK	.7422	.8315	12.03
PRINCE EDWARD	.6190	.7033	13.62
TAZEWELL	.7951	.8779	10.41
CAPE CHARLES	.9075	.9842	8.45
KING WILLIAM	.5233	.7637	45.94
WYTHE	.7589	.8482	11.77
PULASKI	.6258	.8106	29.53
LANCASTER	.7047	.7449	5.70

COUNTY/CITY	PER CENT OF STATE FUNDS 1973-1974	PER CENT OF STATE FUNDS 1974-1975	Δ%
LOUDON	.7519	.7314	(2.73)
PITTSYLVANIA	.7540	.8651	14.73
GREENE	.7010	.8141	16.13
RAPPAHANNOCK	.7774	.7440	(4.30)
BATH	.6979	.5227	(25.10)
CLARKE	.6820	.7245	6.23
NEW KENT	.6915	.8256	19.39
DICKENSON	.7948	.8276	4.13
NORTHAMPTON	.7001	.8174	16.75
HENRY	.7556	.8687	17.62

APPENDIX E

WEALTH / SIZE	A $3,971-51,683	B $52,155-583,560	TOTALS
1 (387-3951)	CAPE CHARLES 8.45 GREENE 16.13 NORTHAMPTON 16.75 KING GEORGE 20.20	BATH (25.10) RAPPAHANNOCK (4.30) HIGHLAND .57 SURRY 4.01 LANCASTER 5.70 CLARKE 6.23 FALLS CHURCH (6.47) PRINCE EDWARD 13.62 NEW KENT 19.39 KING WILLIAM 45.94	14
2 (4051-144,110)	SCOTT (7.82) DICKENSON 4.13 LEE 7.93 ACCOMACK 8.25 WISE 8.84 TAZEWELL 10.41 YORK 12.03 WYTHE 11.77 CHESAPEAKE 13.43 MONTGOMERY 14.91 HENRY 17.62	ALEXANDRIA (13.21) ARLINGTON (8.36) LOUDON (2.73) WILLIAMSBURG 6.27 FAUQUIER 8.88 HANOVER 13.45	17
TOTALS	15	16	31